

*Orecturus amplus*, a new species  
(Copepoda: Siphonostomatoida: Asterocheridae)  
from an alcyonacean in New Caledonia

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*Abstract.*—A new species of siphonostomatoid copepod, *Orecturus amplus*, is described from New Caledonia, where it is associated with the alcyonacean *Siphonogorgia variabilis* Hickson. The new species may be distinguished from its six congeners by its large size and by detailed features of its external anatomy.

Copepods are frequent associates of Alcyonacea (Humes 1990). Species of the order Poecilostomatoida are by far the most common copepod associates (nearly 180 species) of these cnidarians. Those of other orders are much less frequently found with soft corals (Cyclopoida, 4 species; Harpacticoida, 1 species; and Siphonostomatoida, 3 species). Three poecilostomatoids have been recorded from the alcyonacean *Siphonogorgia*. In Madagascar, *Acanthomolgus hians* (Humes & Ho 1968) lives with *Siphonogorgia pichoni* Verseveldt (host originally reported as *S. pendula* Studer) and *Acanthomolgus longispinifer* (Humes & Ho 1968) with *S. pichoni* (see Humes & Stock 1973). In the Moluccas (at Pulau Gomumu, south of Obi), *Acanthomolgus brevifurca* Humes, 1990, is associated with *S. variabilis* Hickson.

The relatively small number of siphonostomatoid copepods reported to date from soft corals probably reflects the lack of attention so far given to these associations. In this paper, a siphonostomatoid belonging to the genus *Orecturus*, living with *Siphonogorgia* in New Caledonia, is described.

#### Materials and Methods

The host alcyonacean colony was isolated immediately after collection in a plastic bag containing sea water. Sufficient 95%

ethanol was later added to make approximately a 5% solution. After 2–3 hours, the soft coral was gently rinsed, and the wash water poured through a fine net (approximately 120 holes per 2.5 cm, each hole approximately 225  $\mu\text{m}$  square). The copepods were then recovered from the sediment retained.

The copepods were measured and studied in lactic acid. The length of the body does not include the setae on the caudal rami. Dissections were prepared using the wooden slide method described by Humes & Gooding (1964). All drawings were made with the aid of a camera lucida.

Order Siphonostomatoida Thorell, 1859  
Family Asterocheridae Giesbrecht, 1899  
Genus *Orecturus* Humes, 1992  
*Orecturus amplus*, new species  
Figs. 1a–g, 2a–i, 3a–i

*Type material.*—7 ♀♀, 9 ♂♂ from the alcyonacean *Siphonogorgia variabilis* Hickson, in 30 m, outside Récif Mtere, near Nouméa, New Caledonia, 22°20'40"S, 166°13'55"E, 23 Jul 1971. Holotype ♀ (USNM 274207), allotype ♂ (USNM 274208), and 11 paratypes (4 ♀♀, 7 ♂♂) (USNM 274209) deposited in the National Museum of Natural History, Smithsonian Institution, Washington. Remaining paratypes in the collection of the author.

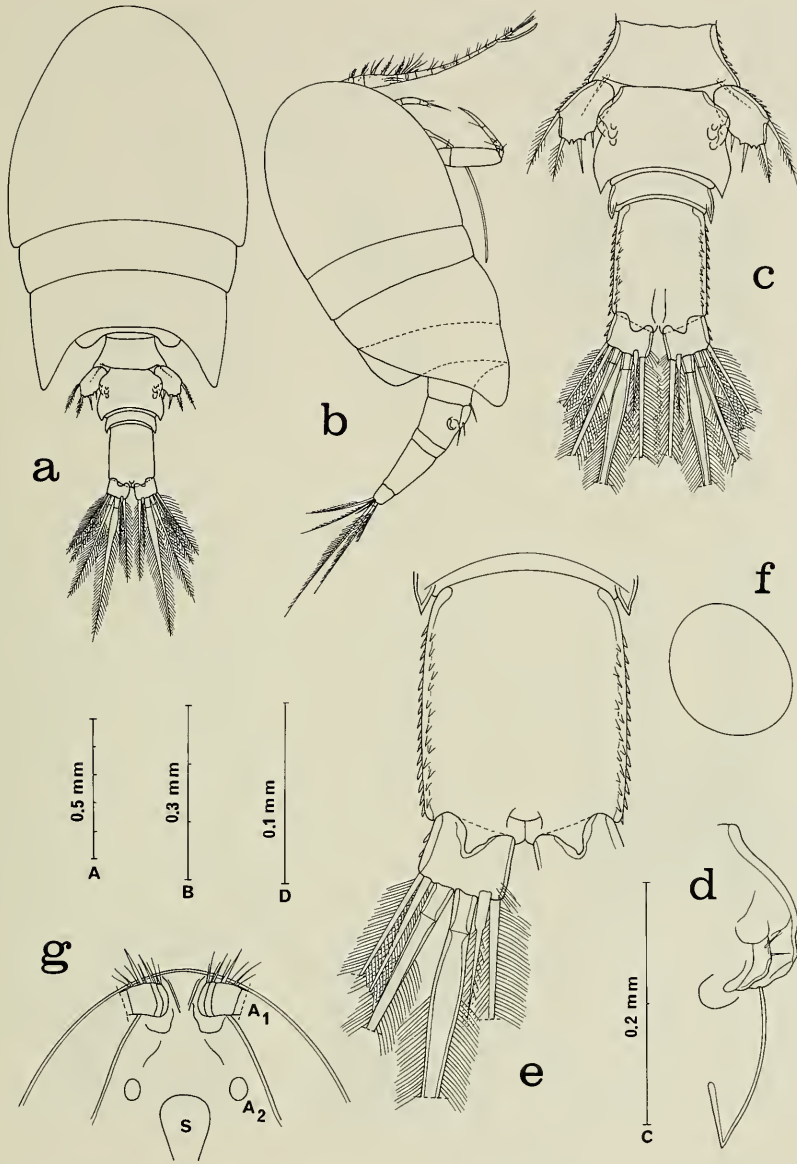


Fig. 1. *Orecturus amplus*, new species. Female. a, body, dorsal (scale A); b, body, lateral (A); c, urosome, dorsal (B); d, genital area, dorsal (D); e, anal somite and caudal ramus, dorsal (C); f, egg, ventral (B); g, rostral area, ventral (B). A<sub>1</sub> = antennule, A<sub>2</sub> = antenna, S = siphon.

*Female*.—Body (Fig. 1a, b) with moderately broad prosome. Length 1.54 mm (1.50–1.56 mm) and greatest width 0.80 mm (0.78–0.88 mm), based on 7 specimens in lactic acid. Greatest dorsoventral thickness 0.55 mm. Somite bearing leg 1 fused with cephalosome. Somite bearing leg 3 with posteriorly extended, narrowly rounded epi-

mera. Somite bearing leg 4 narrow, with rounded epimera, overlapped dorsally by tergum of preceding somite. Ratio of length to width of prosome 1.38:1. Ratio of length of prosome to that of urosome 2.05:1.

Somite bearing leg 5 (Fig. 1c) 120 × 264 μm, indented laterally, with scalelike spines laterally. Genital double-somite broader

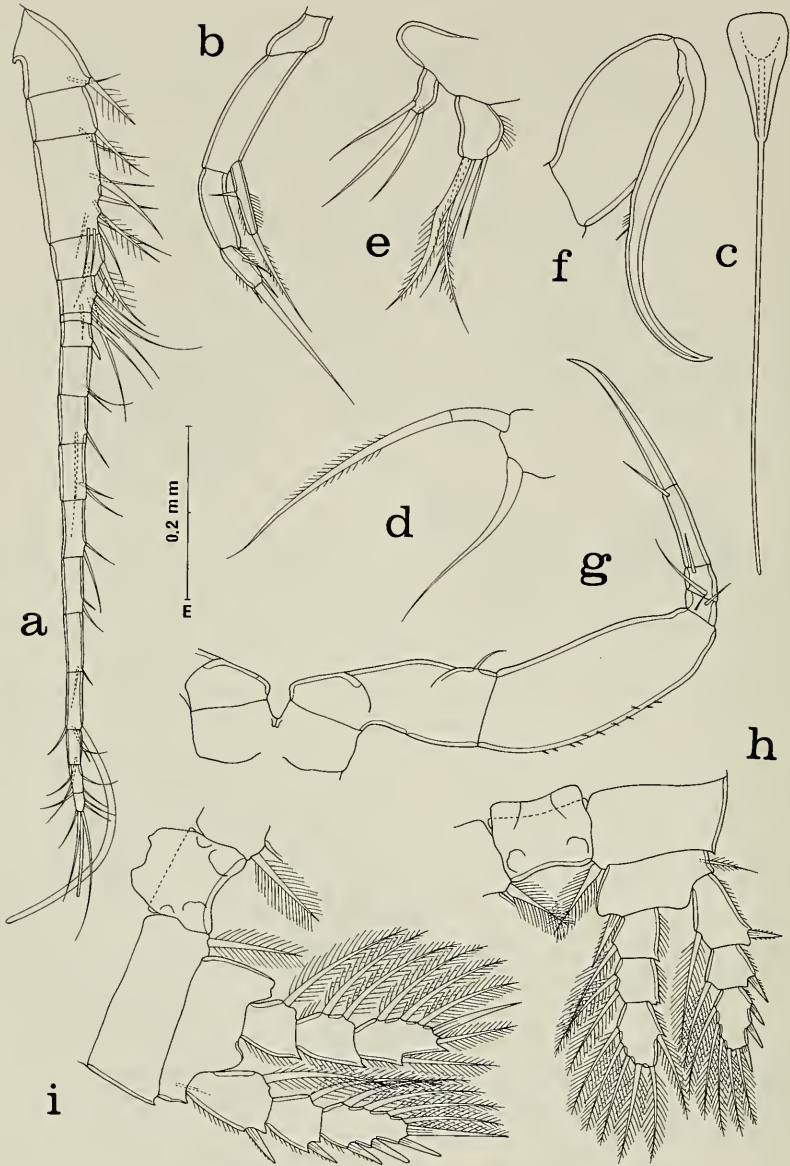


Fig. 2. *Orecturus amplus*, new species. Female. a, antennule, postero-outer (scale C); b, antenna, outer (C); c, siphon, ventral (B); d, mandible, anterior (C); e, maxillule, anterior (C); f, maxilla, posterior (C); g, maxilliped, posterior (C); h, leg 1 and intercoxal plate, anterior (E); i, leg 2 and intercoxal plate, anterior (E).

than long, 117  $\mu\text{m}$  long in midline, 160  $\mu\text{m}$  long including posterolateral spiniform processes, 231  $\mu\text{m}$  wide; ratio 0.51:1, taking length at midline. Genital areas located dorsolaterally near indentation. Each genital area with 2 small setae (Fig. 1d). Two post-genital somites from anterior to posterior 55

$\times$  172  $\mu\text{m}$  (length including posterolateral processes) and 180  $\times$  160  $\mu\text{m}$ , longer somite with small scalelike spines (continuing on dorsal and ventral surfaces, but not shown in Fig. 1c, e).

Caudal ramus (Fig. 1e) 60  $\times$  75  $\mu\text{m}$ , wider than long, ratio 0.8:1. Dorsal seta 70



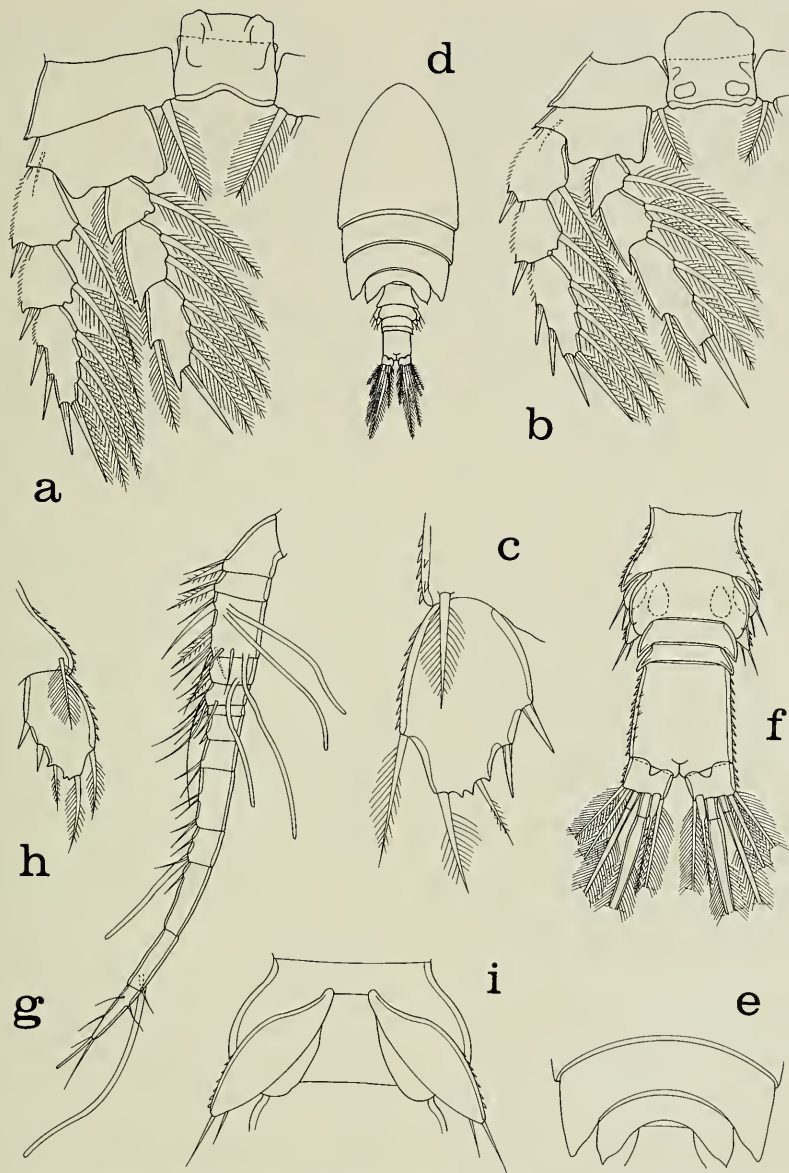


Fig. 3. *Orecturus amplus*, new species. Female. a, leg 3 and intercoxal plate, posterior (scale E); b, leg 4 and intercoxal plate, anterior (E); c, leg 5, ventral (C). Male. d, body, dorsal (A); e, somites of legs 3 and 4, dorsal (B); f, urosome, dorsal (E); g, antennule, dorsal (C); h, leg 5, ventral (D); genital somite showing leg 6, ventral (D).

$\mu\text{m}$ , with elongate pedicel. Outer lateral seta  $250 \mu\text{m}$ , outermost terminal seta  $275 \mu\text{m}$ , innermost terminal seta  $340 \mu\text{m}$ , and 2 median terminal setae  $460 \mu\text{m}$  (outer) and  $625 \mu\text{m}$  (inner) swollen proximally. All setae with long lateral setules. Outer margin of ramus with few scalelike spines and pos-

tero-inner corner with group of slender setules.

Dorsal surface of body without visible sensilla.

Entire egg sac not seen, but isolated egg oval (Fig. 1f),  $226 \times 179 \mu\text{m}$ .

Rostrum (Fig. 1g) weak. Antennule (Fig.

2a) 585  $\mu\text{m}$  long, 17-segmented. Lengths of its segments (measured along their posterior nonsetiferous margins): 39 (78  $\mu\text{m}$  along its anterior margin), 26, 83, 26, 25, 4, 21, 34, 36, 36, 38, 38, 39, 44, 26, 23, and 13  $\mu\text{m}$ , respectively. Formula for armature: 2, 2, 10, 2, 6, 1, 1, 2, 2, 2, 2, 2, 2 + 1 aesthetasc, 2, 3, and 5 + 1 aesthetasc. Enlarged seta on third segment 74  $\mu\text{m}$  long. Certain setae on segments 1–4 with lateral setules. Antenna (Fig. 2b) with elongate, 1-segmented exopod  $57 \times 10 \mu\text{m}$ , bearing short inner seta and long terminal barbed seta 95  $\mu\text{m}$ ; both sides of exopod with setules. Endopod with first segment unarmed, second segment with 3 short setae and long terminal seta 120  $\mu\text{m}$  long.

Siphon (Fig. 2c) 935  $\mu\text{m}$  long, reaching almost to ventral edge of intercoxal plate of leg 4.

Mandible (Fig. 2d), maxillule (Fig. 2e), and maxilla (Fig. 2f) resembling those of congeners (see Humes, 1992, 1993, 1994). Maxilliped (Fig. 2g) with basis lacking inner seta but having small spinules along outer margin. Endopod 3-segmented, armed with 2,2,1; terminal claw 120  $\mu\text{m}$ .

Legs 1–4 (Figs. 2h, i, 3a, b) segmented and armed as follows (Roman numerals indicating spines, Arabic numerals representing setae):

- $P_1$  coxa 0-1 basis 1-I exp I-1; I-1; II,I,5  
 enp 0-1; 0-2; 1,5  
 $P_2$  coxa 0-1 basis 1-0 exp I-1; I-1; III,I,4  
 enp 0-1; 0-2; 1,1,I,3  
 $P_3$  coxa 0-1 basis 1-0 exp I-1; I-1; II,II,3  
 enp 0-1; 0-2; 1,I,3  
 $P_4$  coxa 0-1 basis 1-0 exp I-1; I-1; II,II,3  
 enp 0-1; 0-2; 1,I,2

Leg 1 with inner barbed spine on basis 52  $\mu\text{m}$ .

Leg 5 (Fig. 3c) placed ventrally (as shown in Fig. 1c). Suboval free segment  $107 \times 70 \mu\text{m}$ , ratio 1.53:1. Five setae from outer to inner 75, 65, 36, 25, and 27  $\mu\text{m}$ . Two innermost setae stout, almost spine-like, and lacking setules. Other setae with lateral setules. Few scalelike spines along

outer edge of free segment. Adjacent dorsal seta, here located ventrally, 52  $\mu\text{m}$  with lateral setules.

Leg 6 represented by 2 small setae on genital area (Fig. 1d).

Color of living specimens red, eye red.

*Male*.—Body (Fig. 3d) with prosome more slender than in female. Length 0.98 mm (0.94–1.02 mm) and greatest width 0.43 mm (0.40–0.45 mm), based on 9 specimens in lactic acid. Greatest dorsoventral thickness 0.33 mm. Somite bearing leg 4 with sharply pointed epimera (Fig. 3c). Ratio of length to width of prosome 1.69:1. Ratio of length of prosome to that of urosome 2.46:1.

Somite bearing leg 5 (Fig. 3f)  $73 \times 127 \mu\text{m}$  including processes (length at midline 62  $\mu\text{m}$ ). Genital somite  $60 \times 86 \mu\text{m}$  including leg 6 (length at midline 65  $\mu\text{m}$ ). Three postgenital somites from anterior to posterior  $42 \times 112 \mu\text{m}$  (length at midline 26  $\mu\text{m}$ ),  $26 \times 104 \mu\text{m}$  (length at midline 16  $\mu\text{m}$ ), and  $104 \times 112 \mu\text{m}$ .

Caudal ramus  $39 \times 52 \mu\text{m}$ , ratio 0.75:1, resembling that of female.

Dorsal surface of body without visible sensilla. Urosome with scalelike spines as in female.

Rostrum as in female. Antennule (Fig. 3g) 13-segmented, with segments 8 and 9 clearly separated (in other species these segments tending to be fused). Lengths of segments (measured along their posterior nonsetiferous margins): 21 (52  $\mu\text{m}$  along anterior margin), 22, 42, 23, 13, 9, 14, 26, 48, 29, 57, 52, and 48  $\mu\text{m}$ , respectively. Formula for armature: 2, 2, 10 + 3 aesthetascs, 2 + 1 aesthetasc, 6, 1, 1, 2, 4, 2, 1, 1 + 1 aesthetasc, and 5 + 1 aesthetasc. Aesthetascs on segments 3, 4, and 10 (these present in all males examined) very hyaline. Antenna as in female.

Siphon, mouthparts, and legs 1–4 like those of female.

Leg 5 (Fig. 3h) with free segment  $50 \times 32 \mu\text{m}$ , ratio 1.56:1, otherwise placed ventrally and similar to that of female.

Leg 6 (Fig. 3i) posteroventral flap on genital somite bearing 2 slender setae.

Color of living specimens as in female.

*Etymology*.—The specific epithet *amplus*, Latin meaning large, alludes to the relatively large size of this species compared to congeners.

*Remarks*.—*Orecturus amplus* may be distinguished by its size. None of its six congeners exceeds a length (in the female) of 1.25 mm, with their average length of only 1.11 mm. Selected features for further differentiation are as follows. In *O. braccatus* (Stock & Kleeton 1963) the genital double-somite is rectangular. In *O. excavatus* Humes, 1989, the outer side of segment 1 of the exopod of leg 1 is excavated and the posterior part of the claw of the maxilliped is swollen. In *O. finitimus* Humes, 1993, the enlarged seta on segment 3 of the antenna is longer than the segment and the basis of the claw of the male maxilliped has a low prominence. In *O. forticulus* Humes, 1993, the prosome is broad, the maxilla has an unusually stout claw, the somite bearing leg 3 has sharply pointed epimera, and the first segment of the exopod of leg 1 has an outer thornlike process. In *O. grandisetiger* Humes, 1992, the prosome is broad, the enlarged seta on segment 3 of the antennule is longer than the segment, the somite bearing leg 3 has sharply pointed epimera, and the basis of the male maxilliped has a weak inner protuberance and lacks spinules. In *O. sakalavicus* Humes, 1994, the antennule lacks an enlarged seta, the somite bearing leg 3 has sharply pointed epimera, and the basis of the male maxilliped has an inner lobe and lacks spinules. The outer spinules on the basis of the maxilliped seen in the new species are found only in *O. forticulus*.

The color of living colonies of the soft

coral host, *Siphonogorgia variabilis*, was as follows: slender creamy white stems, smaller branches and twigs pale yellow, polyps lavender blue to red. The red color of *Orecturus amplus* more closely resembles that of the polyps than that of other parts of the colony, suggesting that the copepods may live on or in the polyps.

#### Literature Cited

- Humes, A. G. 1989. *Acontiphorus excavatus*, a new species (Copepoda: Siphonostomatoidea) associated with the soft coral *Dendronephthya* (Alcyonacea) in the Indo-Pacific.—Proceedings of the Biological Society of Washington 102:916–923.
- . 1990. Synopsis of lichomolgid copepods (Poecilostomatoida) associated with soft corals (Alcyonacea) in the tropical Indo-Pacific.—Zoologische Verhandlungen 266:1–201.
- . 1992. Copepoda associated with the thorny coral *Antipathes* (Antipatharia) in the Indo-Pacific.—Journal of Natural History 26:709–744.
- . 1993. Copepoda associated with gorgonaceans (Cnidaria) in the Indo-Pacific.—Bulletin of Marine Science 53:1078–1098.
- . 1994. Copepoda associated with octocorals in northwestern Madagascar, including *Orecturus sakalavicus* n. sp. from the telestacean *Ceologorgia palmosa*.—Transactions of the American Microscopical Society 113:117–126.
- , & R. U. Gooding. 1964. A method for studying the external anatomy of copepods.—Crustaceana 6:238–240.
- , & J.-S. Ho. 1968. Cyclopoid copepods of the genus *Lichomoligus* associated with octocorals of the families Xeniidae, Nidaliidae, and Telestidae in Madagascar.—Proceedings of the Biological Society of Washington 81:693–750.
- , & J. H. Stock. 1973. A revision of the family Lichomolgidae, cyclopoid copepods mainly associated with marine invertebrates.—Smithsonian Contributions to Zoology 127:1–368.
- Stock, J. H., & G. Kleeton. 1963. Copépodes associés aux invertébrés des côtes du Roussillon 3.—*Acontiphorus braccatus* n. sp. un cyclopoïde siphonostome associé aux six octocoralliaires.—Vie et Milieu 14:551–560.